depressa, D'Orb.; and *Peneroplis planatus*, F. & M., occurred very rarely in a few shallow places. The last-mentioned forms are frequent at several localities along the coast of Dalmatia, and, being confined to a shallow horizon, may serve to characterize a subdivision of the Littoral Zone in the diffusion of the Foraminiferal fauna.—*Proceed. Imp. Geol. Instit. Vienna*, February 19, 1867.

Observations on the Situation of the Alkaloids in the Bark of the Cinchonæ. By Carl Müller.

Some years ago M. Wigand thought he had demonstrated that the alkaloids of the Cinchonas reside in the liber. He had, in fact, observed that when thin transverse sections of the bark of these plants are soaked in a solution of cochineal, the liber-region of these sections is most strongly coloured. Thinking that the alkaloids in question might perhaps act as mordants and possess the property of fixing colouring-matters, M. Wigand had the idea of treating simultaneously, with the same tincture of cochineal, flax-bark previously soaked in an infusion of bark, and cinchona-bark deprived of all traces of alkaloid. He then observed that the flax-bark became vividly coloured, whilst that of the Cinchona had lost the property of fixing the pigment; and from this he concluded that as in the first experiment the liber absorbed the cochineal most freely, this must be due to the fact that this part of the bark was richest in alkaloid.

M. Carl Müller, having repeated these experiments without arriving at the same results, attempted to solve the question by the method of direct determination. For this purpose it was necessary to effect the complete separation of the liber from the parenchyma; and this was by no means easy, as the liber of the Cinchonas does not form thick layers, but is composed of small and scarcely visible groups of cells. M. Müller nevertheless thinks he has succeeded in surmounting all the difficulties by the following process:—

He commences by reducing the bark, by means of a plane, into thin shavings, which he then breaks up by shaking them in a bottle, at first with fragments of iron wire, and then with fine sand. By examining under the microscope the fragments of bark thus obtained, he finds that the parenchyma is entirely detached from the liber; and he effects the separation of these two elements by an ingenious process. He pours the contents of the bottle into the body of a retort communicating on the one hand with a pair of bellows, and on the other with another retort, which is in communication with a receiver full of water. It is clear that by setting the bellows in action the powder contained in the first retort will be strongly agitated. The particles of parenchyma, being lighter than the rest, are then driven through the whole apparatus into the receiver, whilst the liber remains in the first retort or does not pass beyond the second one. The nature of the deposits found in the various parts of the apparatus may then be easily ascertained by microscopic examination. When this operation is completed, M. Müller treats

the contents of the receiver and those of the retort with dilute sulphuric acid, so as to extract all the alkaloid in the form of the hydrate $C^{40}H^{24}N^2O^4$, 6HO, of which he then determines the quantity after desiccation at 212°.

This analysis proves that the parenchyma contains 9·876 per cent. of quinine, whilst the liber only contains 2·462 per cent., or about one-fourth of the quantity that exists in the parenchyma. This result is therefore precisely the reverse of that which would have been expected from M. Wigand's experiments. It is clear also that the quinine, although much more abundant in the parenchyma, does exist in the liber. It even appears that it is the more abundant in proportion as the bark is more developed, which would lead one to suppose that the production of quinine is in relation with the formation of the liber. This consideration has naturally led M. Müller to inquire at what period and in what region of the bark the first appearance of the quinine takes place; and he proposes to take up this question as soon as he can procure a sufficient number of living Cinchona-plants.—*Pringsheim's Jahrbücher*, 1866; *Bibl. Univ. Bull. Sci.* February 25, 1867, pp. 182–184.

On the Cephalic Disk of the Remora (Echenels).

By E. Baudelot.

The disk on the head of the Remora has from the earliest period attracted the attention of observers. Among modern naturalists, some, such as Vogt and Stannius, have expressed the opinion that this disk might be regarded as the equivalent of a dorsal fin; but this view has not been supported by a rigorous determination, certain internal pieces of the disk having remained undetermined. Moreover the mechanism by means of which the fixation is effected has never been analyzed and explained satisfactorily.

The investigations which I have the honour to submit to the Academy had for their object the solution of these still obscure questions.

The disk of the Remora, as is well known, occupies the upper surface of its head. Its form is a very elongated oval, of which the slightly raised margins are formed by a fold of skin arranged so as to form all round the organ a sort of moveable frame. The upper surface of the disk is flat; on each side of the median line it presents a series of little transverse plates, which are nearly parallel and a little inclined backwards, so as partially to cover each other, like the laths of a Venetian blind. Between these laminæ there are the same number of corresponding empty spaces.

Except at its margins, the disk is sustained by an internal framework, formed by a considerable number of small bones distributed in a series of similar segments regularly arranged (*échelonnés*) from behind forwards. Each segment consists of the following pieces, four in number—an interspinous bone, two rays, and an articular ossicle.

a. The interspinous bone is a small unpaired median piece, placed at the lower surface of the disk, of the form of a slender spine, with